Space Weather Forecast

Issued on Tuesday, 18 April 2023 at 12:27 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: G1/Minor Geomagnetic Storms likely 20-21 Apr due to CME (Coronal Mass Ejection) arrival, with a slight chance of G2/Moderate or G3/Strong Storms. Chance of Moderate-class X-ray flares (R1-R2 Minor-Moderate radio blackouts) throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low, with only a few mainly low-level Common-class flares observed. There are eight active regions in total on the visible disc. The largest region is in the northern hemisphere near centre disc, but the area appears magnetically stable at this time. A string of three regions in the south collectively present a slightly increased risk of significant flare activity as well as a new region in the far east. All other regions are small and simple. No Earth-directed CME have been observed in available imagery in the last 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind was initially slow before a steady rise to slightly elevated levels from the latter part of the UTC day on 17 Apr, possibly due to a weak connection to a fast solar wind region. Total magnetic field strength was at weak to moderate levels. The important north-south component was generally weak, with brief periods at moderately positive and negative levels. Geomagnetic activity was Quiet.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to generally be Low, with a likelihood of isolated Moderate activity. There is also a chance for activity from a region beyond the northeastern limb, which is forecast to rotate onto the visible disc in the coming days.

Solar Wind / Geomagnetic Activity: Two CMEs may affect the Earth in this period. One, as a low confidence glancing blow on 19 Apr, with a further more direct hit, expected on 20 or 21 Apr. Otherwise solar winds are expected to remain between slightly elevated and background levels, with an initial period more predominantly at slightly elevated levels as a result of weak coronal hole high speed streams connections.

Geomagnetic activity is forecast to be Quiet to Unsettled on 18 Apr and much of if not all of 19 Apr. There is a very slight chance of G1/Minor storm intervals due to the potential glancing CME on 19 Apr. Activity is expected to reach Active to G1/Minor Storm levels on 20 or 21 Apr due to the anticipated CME arrival, with a slight chance of G2/Moderate or G3/Strong Storm conditions.

Energetic Particles / Solar Radiation: Solar radiation storms are not expected and should remain at background levels.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	10	60	60
Strong	G3	No	1	1	30	30
Severe	G4	No	1	1	5	5
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	50	50	50	50
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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